Requested Patent: GB494542A

Title:

IMPROVEMENTS IN OR RELATING TO ALIGHTING GEAR FOR AIRCRAFT ;

Abstracted Patent: GB494542 ;

Publication Date: 1938-10-27 ;

Inventor(s): ;

Applicant(s):

WALTER BLUME;; ARADO FLUGZEUGWERKE GES MIT BE ;

Application Number: GB19370032783 19371127 ;

Priority Number(s): GB19370032783 19371127 ;

IPC Classification: ;

Equivalents: ;

ABSTRACT:

PATENT SPECIFICATION

Application Date: Nov. 27, 1937. No. 32783/37. 494,542

Complete Specification Accepted: Oct. 27, 1938.

COMPLETE SPECIFICATION

Improvements in or relating to Alighting Gear for Aircraft

We, WALTER BLUME, a citizen of Germany, of Schillerstrasse 3, Brandenburg (Havel), Germany, and ARADO FLUGZEUGWERKE GESELLSCHAFT MIT BESCHRAENKTER HAFTUNG, a German Company, of Brandenburg (Havel), Germany, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to improvements in alighting gear for aircraft and more particularly to retractible shock-absorbing tail-wheels or like mountings.

It is an object of the invention to provide an improved mounting of this type.

The retractible tail-wheel mounting of the invention includes a strut carrying the tail-wheel and a strut pivotally connected thereto which is adapted to rotate the mounting about a horizontal axis at the lower end of the rearmost fuselage bulkhead.

Tail skids have already been proposed in an amphibian type of aircraft in which a swivelling wheel is advanced and retracted by pneumatic means but such skids are without covers so that they do not form a streamlined trailing end of the fuselage when in elevated position and this is objectionable from an aerodynamic point of view since eddies form at this point.

It has also been proposed to provide tail-wheels with spring means which are housed in the rudder when in retracted position, and are advanced and retracted by mechanism comprising a threaded spindle and a nut. Such tail-wheels are not equipped with covers, which involves the aforesaid drawbacks, and, besides, they increase the weight of the rudder which is not desirable with respect to stabilization.

Retractible mountings equipped with a skid instead of a steering wheel are also known and have been equipped with a streamlined cover. Mountings of this type have the drawback that the skid projects from the fuselage in the retracted position and increases the aerodynamic resistance.

The invention avoids the drawbacks of known constructions. It is characterised by the combination of two features namely the steerable arrangement of the tail-wheel with a cover and the formation of the cover of the mounting such that in the retracted position of the mounting it forms an externally flush extension of the rear end of the fuselage.

In the accompanying drawing the trailing end of an aeroplane fuselage equipped with the novel mounting is illustrated by way of example.

In the drawing, Fig. 1 is an elevation of the trailing end, with the new mounting lowered, and Fig. 2 is an elevation of the trailing end, with the new mounting elevated.

Referring now to the drawing, 1 is the trailing end of the fuselage of an aeroplane which is inclined at 22, with a fin and a rudder 2, and a rudder control 4 shown in dot and dash lines. The fin and the rudder are shown broken away at their upper ends. 5 is the rearmost bulkhead of the aeroplane, the base of which coincides with the lower end of the inclined surface 22, and 6 is the next adjacent intermediate bulkhead.

7 is a horizontal hinge at the base of the bulkhead 5, and *t* is the new mounting which is pivotally connected to the bulkhead by the hinge. The mounting is equipped with a suitable frame shown in dotted lines, and with a cover 8 which in the elevated position of the mounting, Fig. 2, is flush with the cover of the trailing end of the fuselage 1.

Mounted to turn in the frame of the mounting *t* is a shaft 9 equipped with a fork at its lower end in which a steering wheel 10 is mounted to rotate. The cover 8 is recessed at its lower end for the reception of a cover portion 11 which is attached to, and turns with, the shaft 9 and extends over the major portion of the steering wheel 10.

12 is a bearing for the upper end of the shaft 9 in the mounting frame, 13 is a pulley on that end of the shaft 9 which projects beyond the bearing 12, 14 is a cable placed on the pulley, and 15 is a guide pulley on the bulkhead 5 over which the cable extends to the cockpit.

[*Price* 1/-]

The means for operating the rudder control 4 and the cable 14 are preferably so arranged that they can be manipulated by the pilot at the same time, so that the rudder 2 and the steering wheel 10 are turned together.

The shaft 9, in addition to its function as the support of the steering wheel 10, acts as a strut or brace for the frame of the mounting *t* and as a thrust member for transmitting the load from the fuselage to the steering wheel. 16 is a ball-and-socket joint on the pulley 13, and 17 is one member of a telescoping spring buffer the lower end of which is connected to the ball-and-socket joint 16 and the upper end of which is inserted in the complementary member 17^1. A spring is inserted in the two members. The upper end of the member 17^1 is pivotally connected to a nut 19 on a threaded portion 18 of a spindle mounted to rotate in bearings 20 and 21 of the respective bulkheads 5 and 6. Means, not shown, must obviously be provided for holding the nut 19 against rotation, and any suitable means, not shown, are provided at the cockpit for rotating the spindle.

While the aeroplane is on the ground, any shocks caused by irregularities are absorbed by the spring buffer 17, 17^1, and at the same time the aeroplane is steered partly by means of the steering wheel 10 and partly by means of the rudder 2. When the aeroplane is in the air, the spindle 18 is rotated by the pilot to move the nut 19 from the position in Fig. 1 into the position in Fig. 2, moving the spring buffer to the left and turning the mounting *t* about its hinge 7 until the upper end of the cover 8 bears against the inclined end 22 of the fuselage cover. At the same time, the shaft 9 is turned to move the steering wheel 10 into its neutral or central position so that its cover 11 is flush with the cover 8 which in turn is flush with the cover of the trailing end of the fuselage end 1. In this manner, a continuous streamlined body is formed as far as the lower end of the cover 11 for the steering wheel 10. This cover extends over the major portion of the steering wheel and exposes only so much of the wheel as is required for its unobstructed running on the ground.

It will be understood that the means for rocking the mounting *t* about the hinge 7, and the means for turning the shaft 9 on which the steering wheel 10 is mounted to rotate, do not interfere with one another in any way so that it is possible to turn the steering wheel 10 and the rudder 2, notwithstanding the hinged connection of the mounting *t* to the fuselage. At the same time the cover 11 of the steering wheel 10 is not substantially wider than the wheel itself.

For lowering the mounting *t*, the spindle 18 is rotated in the opposite direction to that in which the mounting *t* is elevated.

It is to be understood that the invention is not limited to the construction which has been shown and described by way of example.

The shaft 9 and the spring buffer 17, 17^1 constitute two pivotally connected struts which, being interposed between the air frame and the tail wheel, support the weight of the tail when the aeroplane is on the ground.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A retractible shock-absorbing tail-wheel or like mounting for aircraft including a strut carrying the tail-wheel and a strut pivotally connected thereto which is adapted to rotate the mounting about a horizontal axis at the lower end of the rearmost fuselage bulkhead, characterised by the combination of two features, namely, the steerable arrangement of the tail-wheel with a cover and the formation of the cover of the mounting in such manner that in the retracted position of the mounting it forms an externally flush extension of the rear end of the fuselage.

2. A tail-wheel or like mounting as claimed in claim 1, characterised in that the strut carrying the tail-wheel is provided with a cover which also encloses the wheel with the exception of the free part required for unobstructed running on the ground.

3. A tail-wheel or like mounting as claimed in claims 1 and 2, characterised in that the part of the cover enclosing the wheel can be turned with respect to the remaining part of the cover of the mounting simultaneously with the wheel.

4. A tail-wheel or like mounting as claimed in claim 3, characterised in that the part of the cover enclosing the wheel can turn about the axis of the strut carrying the wheel.

Dated this 26th day of November, 1937.

CRUIKSHANK & FAIRWEATHER,
86, St. Vincent Street, Glasgow, C.2, and
65/66, Chancery Lane, London, W.C.2,
Agents for the Applicants.

Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1938.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1

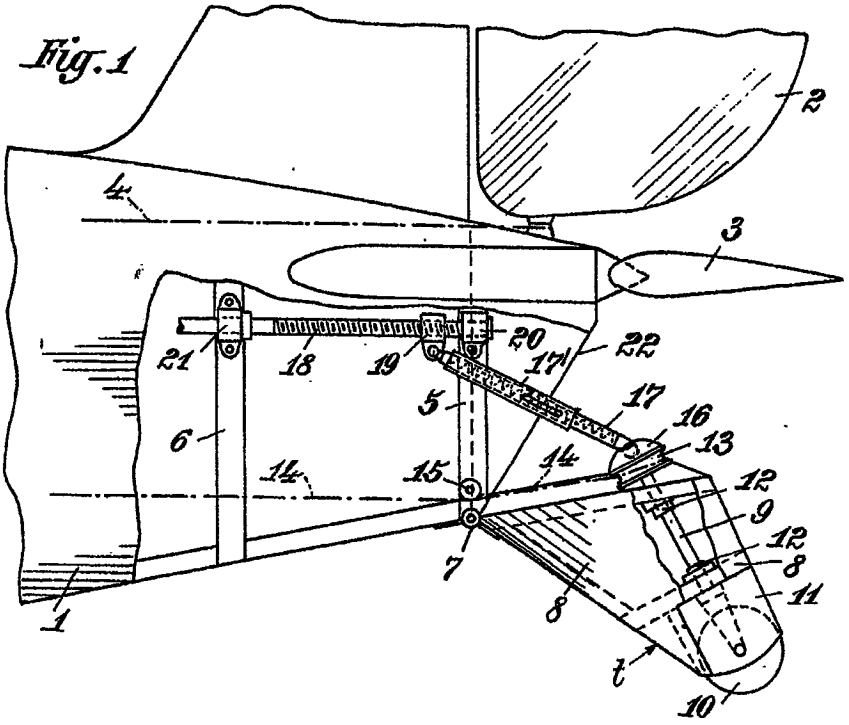
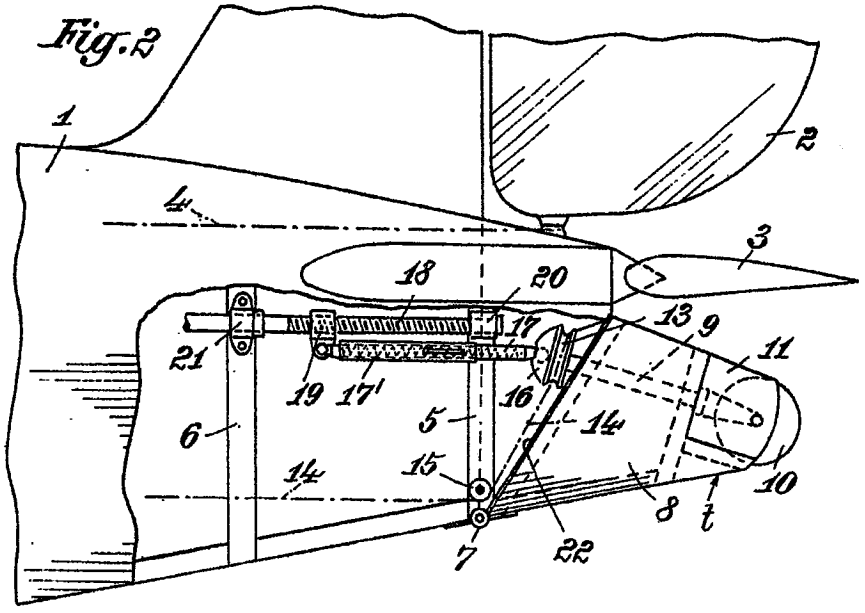


Fig. 2



Malby & Sons, Photo-Lith.